

Attorney's Docket: 1999CH017
Serial No.: 10/070,622
Art Unit: 1731

Response to the Final Rejection of June 4, 2003

REMARKS/ARGUMENTS

The Office Action mailed June 4, 2003 has been carefully considered together with each of the references cited therein. The amendments and remarks presented herein are believed to be fully responsive to the Office Action. Attached to this amendment is a Request for Continued Examination. Accordingly, entry of the above amendments and reconsideration of the present Application in view of the following remarks is respectfully requested.

Applicant would like to thank the Examiner for the opportunity to discuss the merits of the case in a telephonic interview with the Applicant's representative, Mr. Silverman, on July 30, 2003. In the interview Mr. Silverman pointed out that the instant invention is directed to a surface finishing process wherein an aqueous solution consists of water, polyethylene glycol having a molecular weight in excess of 1500, and another additive selected from the group consisting of a water soluble dye, an optical brightener, a wet strength additive, an agent for pH adjustment, a non-finishing additive, and mixtures thereof is applied to a surface of the paper or board to provide a surface-treated paper or board sheet. The Examiner had rejected the previous claims in view of Rohringer et al. on the basis that the Rohringer et al. process was directed to a sizing process which employed an anionic starch. The Examiner considered such a starch a temporary "wet strength additive." Mr. Silverman pointed out that in the Applicant's Specification, the "wet strength additive" was defined in Applicant's Specification on page 9, in the paragraph beginning: "Suitable wet strength additives W_3 . . ." wherein only synthetic strength additives were disclosed and the disclosure of suitable wet strength additives did not include any natural or chemically modified starches such as the anionic starch of the Rohringer et al. process. For example, Applicant's wet strength included a crosslinkable product of formaldehyde or glyoxal with urea or melamines or a mixture thereof and/or a crosslinking catalyst. Accordingly, Applicant agreed to include an expression in the claims which more clearly described the invention which did not include anionic starch.

Applicant has amended the claims to attend to housekeeping matters and to more clearly describe the invention. It is not believed that any new matter was introduced by this amendment, and that no additional search is required by the office. Claims 1, 17 and 20 were amended to recite that the wet strength additive (W_3) is a crosslinkable product of formaldehyde or glyoxal with urea or melamines or a mixture thereof and/or a crosslinking catalyst. In claim 1, a further amendment was made to more clearly recite that the aqueous solution (L_W) consists of water and a surface-finishing active ingredient (W), and that the non-finishing formulation additive (F) is selected from the group consisting of an antifoam (F_{11}), an agent for protecting against the damaging effect of microorganisms (F_{12}) and mixtures thereof. Support for these amendments may be found in Applicant's Specification at page 9, in the paragraph beginning on line 10, page 11, lines 16 to 33, and original claims 1 and 7. Claims 1, 2, 3, 5, 6, 12, 13, 14 and 15 were amended to provide antecedent basis and to be consistent with amended claim 1 in the recitation of the "further additive"

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element terms. Support for these amendments may be found in original claims 1-15. In claim 9, the applying step was amended to recite that the applying step comprises —spraying said aqueous solution up to an entire moisture content of less than 30 % by weight on a dry basis—. Support for this amendment may be found in Applicant's Specification in the paragraph bridging pages 12 and 13. Claim 11 was amended to recite an active process step and to be consistent with amended claim 9. Support for this amendment may be found in originally filed claim 9. It is believed that no new matter has been introduced by these amendments.

Applicant's invention relates to a process for the surface-finishing of a paper or board comprising applying to the surface of the paper or board an aqueous solution consisting of a polyethylene glycol having an average molecular weight greater than 1500 or the polyethylene glycol and at least one additional additive which is selected from the group consisting of a dye(W_1), an optical brightener(W_2), a wet strength additive(W_3), an agent for pH adjustment(W_4), a non-finishing additive(F), and mixtures thereof wherein the wet strength additive(W_3) is a crosslinkable product of formaldehyde or glyoxal with urea or melamines or a mixture thereof and a crosslinking catalyst. Applicant's aqueous solution is applied to the surface of a hydrophilic paper or board sheet in a manner by which the hydrophilic paper or board sheet is not soaked, such as by spraying, and the treated paper or board is subsequently smoothed and dried in a manner which increases the concentration of the polyethylene glycol at the surface. The aqueous solution of the instant invention can be applied to the surface of the hydrophilic paper or board sheet as it is produced from a paper making machine at the dry end before the smoothing press, and/or with remoistening before a calendering step in the production of calendered paper or board. By the term aqueous solution, it is meant that the solution is a true solution or a colloidal solution and if any insoluble components are present, their proportion is so small that the aqueous remains an essentially clear solution.

Claims 1-6 and 10-22 stand rejected under 35 USC § 102(b) as being anticipated by Rohringer et al., US. Patent No. 5,622,749('749). This rejection is respectfully traversed. Rohringer et al. describes a method for the fluorescent whitening of paper by application of the defined optical brightener in paper coatings or in the size press, as mentioned at column 1, lines 29-31, and as described in more detail for the coatings from column 1, line 37, to column 7, line 7, and in particular in column 1 in lines 52-58, and for application in the size press, at column 7, in lines 8-22. In every instance and in Example 8b, Rohringer requires and claims the presence of the organic solvent "propylene glycol" and an anionic starch. Rohringer et al. further requires that the paper stock be saturated or at least have an uptake of about 35 weight percent of the treating solution. Applicant's process and paper or board does not include any solvent such as propylene glycol and does not contain any starch or modified starch. Applicant's wet strength additive is a synthetic polymer which is a crosslinkable product of formaldehyde or glyoxal with urea or melamines and/or a crosslinking catalyst. The process of the present invention is neither a coating nor a sizing in a size press, but is a surface-finishing by application of the defined aqueous solution (L_w) followed by the defined pressure treatment in the smoothing rolls and drying,

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and the aqueous solution does not contain any anionic starch. The coating, in particular as described in Rohringer et al., and especially as exemplified, is a treatment with a coating composition which is an aqueous slurry or dispersion containing undissolved matter, in particular the white pigments, and furthermore a substantial proportion of a binder. The compositions (L_w) in the process of the invention are not slurries or dispersions, but are aqueous solutions as defined. The Example 8b relates to a process wherein the paper is soaked until the uptake reached about 35 weight percent. Example 8 of Rohringer et al. relates to a process in which a paper is impregnated in the size press with a composition as defined at page 12 in lines 23-25, which is an aqueous sizing composition containing a minor proportion of the organic solution of Example 8(A) and a major proportion of anionic starch. The solution of Example 8(A) of Rohringer et al. is an organic solution of 10 parts of the defined optical brightener dissolved in a mixture of 12.5 parts of a polyethylene glycol (PEG) with a molecular weight greater than 1500 and 25 parts of propylene glycol and that contains also 1.6 parts of nitrilotriacotic acid (NTA)---this solution is not an aqueous solution but is an organic solution. The treatment described in Example 8(B) of Rohringer et al. is a sizing with anionic starch in an aqueous solution containing 8% of the anionic starch and a quantity of the solution of Example 8(A) corresponding to 6 g/l of the optical brightener, i.e. 0.6% of the optical brightener accompanied by 0.75% of PEG 1500, 1.5% of propylene glycol and 0.096% of NTA and the substrate is impregnated with this composition to an uptake of 35%. Rohringer et al. represents a sizing with an anionic starch, i.e. with a starch that has been modified in order to lower its gelling temperature, so as to provide a water repellency and the presence of the low molecular weight (less than Applicant's 1500 MW) PEG and propylene glycol solvent mixture serves only as a solvent for the optical brightener. As mentioned above, sizing is a treatment that produces water repellency. Applicant's aqueous solution does not contain any modified starch as a wet strength improver. Thus, the coating process of Rohringer et al. is different from the instant invention as claimed, and Rohringer et al does not contain a process for the surface finishing of paper, nor are any of the coating compositions the same as applicant's aqueous solutions. Furthermore Rohringer et al. does not provide any suggestion or motivation for any surface finishing of paper or board with an aqueous solution as disclosed in the present application which does not contain a modified starch. Claim 1 is closed ended and does limit the combination of the claimed compound with other compounds. Therefore, the rejection of claim 1 under §102(b) as anticipated by Rohringer et al. (US Patent 5,622,749) should be withdrawn for the reason that unless all of the same elements are found in exactly the same situation and united in the same way to perform the identical function in a single prior art reference there is no anticipation. The rejection of claims 2-6 and 9-16 under 35 USC § 102(b) as being anticipated by Rohringer et al., US. Patent No. 5,622,749('749) should be withdrawn for the reasons given in support of amended claim 1.

Claims 9-11 stand rejected under 35 U.S.C. §103(a) as obvious being over US Patent No. 3,779,791 Ploetz et al. This rejection is respectfully traversed. The '791 reference relates to a method for sterilization of a paper packaging material. The '791 reference discloses that in order to provide a paper which is acceptable of

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resisting temperatures of 200°C and more without essential loss of strength and flexibility. According to the '791 reference, it was discovered that a paper could be completely impregnated with a mixture of polyethylene glycols having molecular weights from 2000 to 4000 and subsequently heated to at least 180°C for a period of 40 minutes while the paper was impregnated. The resulting paper board could be used for baking purposes without becoming brittle or completely disintegrating. There is no disclosure in the '791 if the paper or board so produced would have any acceptable printing properties. Thus, there is no motivation or suggestion for anyone skilled in the art of preparing printing papers to turn to the process disclosed in the '791 patent. The '791 patent is silent on the either the surface treatment of paper or the improvement of the surface of printing papers or board, or the addition of a wet strength additive (W₄). No one skilled in the art, armed with the '791 patent would be motivated to add a wet strength additive in addition to the polyethylene glycol. According to the common meaning of the word "impregnated", which is defined **–to cause to be infused or permeated throughout**, as with a substance. Clearly it is the intent of the Ploetz et al. patent to "completely impregnate" or completely saturate the paper in order to force the polyethylene glycol throughout the paper and thereby gain the benefit of the '791 process. No one skilled in the art reading the '791 reference would expect that simply a surface treatment which does not saturate the paper would not achieve the benefits of the '791 invention which is stated to be resistance to sterilization and extended heating at temperatures in excess of 200°C. Applicant's process is directed to a surface treating process. Applicant's objective is to improve the printing properties of the surface treated paper or board, and nowhere in the '791 reference is it disclosed that the process of the '791 reference has any impact on the printing process. Thus, anyone skilled in the art would recognize that, the Ploetz et al. patent teaches away from a surface treatment which requires an additional wet-strength additive. . In the Ploetz et al. reference, after soaking the paper, the paper is passed through some rolls. These rolls are just rolls for liquor up-take adjustment an not smoothing and/or drying rolls. Following the complete saturation of the paper of the '791 reference, the paper is heated for a period of 40 minutes at high temperature. There is no teaching or suggestion that the previously calendered rolls of the '791 reference would require any further smoothing following the complete impregnation step. In the present invention, smoothing rolls are not rolls for liquor up-take adjustment, but rather have an influence on densification and caliper and on the surface of the paper or board, as mentioned in the specification at page 12, in lines 13-17. The Examiner's assumption that because in Ploetz et al. the completely impregnated paper is passed between two rollers there is provided smoothing, is unsupported. The paper has already been calendered before impregnation and the impregnation of the paper leaves the rolls with a substantial liquid content throughout the paper. Furthermore, the drying step of Ploetz et al. takes place after contact with the two rollers, which is a further indication that no smoothing of the saturated sheet is taking place between the two rollers. Also in the '791 reference, the treatment is not a surface finishing and the impregnated paper is also not subjected to a pressure treatment through smoothing rolls. As stated above, in the process of the instant invention the defined paper or board is surface-finished as defined with the defined solution (L_w) by the defined process, which comprises subjecting the surface-treated substrate to the

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pressure of smoothing rolls. The process of the present invention is neither described nor suggested in Ploetz et al. Ploetz et al. discloses a process which is the opposite of surface treating. Ploetz et al. describes a process for countering the problem of paper becoming brittle and loosing mechanical strength when subjected to sterilizing temperatures in excess of 200°C. Anyone skilled in the art would expect that according to the teachings of Ploetz et al., that unless the paper were treated throughout, the paper will not attain the required heat stability to survive the extreme sterilization process during which the paper is heated for a period of 40 minutes, which well beyond a normal drying step. The Ploetz et al process is aimed at providing a paper with heat resistance strength throughout the cross-section of the paper, and for this reason they completely impregnate the paper after calendering, and they do not just apply the composition on the surface. Thus, the content of Ploetz et al. teaches away from the invention as now claimed in the present patent application which is directed to a surface application. Thus, the Ploetz et al. reference can not be said to contain any suggestion or hint for any surface finishing of the kind claimed in the present patent application. Therefore, the rejection of claims 9-11 under 35 U.S.C. 103(a) as being obvious over Ploetz et al. (US Patent 3,779,791) should be withdrawn for the reason that Ploetz et al. teach away from the present invention, and for the reason that no one skilled in the art armed with the disclosure of Ploetz et al. which silent on any printing properties of sterilized paper, clearly is directed to a serialization process for paper which is completely saturated or completely impregnation and drying process to improve temperature resistance, and is without any teaching or suggestion for a smoothing step would be able to produce applicant's invention for a surface finishing process to produce high quality printing paper or board.

It is respectfully submitted that, in view of the above remarks, the rejections under 35 U.S.C. 102(b) and 103(a) should be withdrawn and that this application is in a condition for an allowance of all pending claims. Accordingly, favorable reconsideration and an allowance of all pending claims are courteously solicited.

An early and favorable action is courteously solicited.

Respectfully submitted,



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Attachment: Random House Webster's Definition(2nd Ed. 2001) of "impregnated"

RANDOM HOUSE
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Second Edition

Library of Congress Catalogue of Published Books in Medicine.

10/070,622
3/4/2002

Typeset and printed in the United States of America.

91765321

ISBN: 0-373-42572-X (Gutenberg book and CD-Audio package)

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RANDOM HOUSE
NEW YORK

Received from <704 331 7707> at 8/11/03 5:08:00 PM [Eastern Daylight Time]

